1:Vaillant A-5 (1928-1936)1941 NU7 Aztec NU7

as the presiding god, who, at the end, transformed himself into the sun, while jaguars ate up the men and giants who then populated the earth. Quetzalcoatl was the divine ruler of the second era, Four Wind, at the expiration of which hurricanes destroyed the world and men were turned into monkeys. The Rain God, Tlaloc, gave the world light in the third epoch, Four Rain, brought to a close by a fiery rain. Chalchihuitlicue,* "Our Lady of the Turquoise Skirt," was a Water Goddess who presided appropriately over the fourth Sun, Four Water, wherein a flood came, transforming men into fish. Our present age, Four Earthquake, is under the control of the Sun God, Tonatiuh, and it will be, destroyed, in time, by earthquakes.[2] (See Plate 52.)

While the versions vary from place to place, we seem to have a recapitulation of the great disasters from flood, volcanic eruption, hurricanes and earthquakes that beset the communities of ancient Mexico. Also there is a reflection of the order in which the gods attained prominence in the local worship. In the history of the Mexican tribes there are references to struggles within single towns between the devotees of two cults, as to which would have the mastery.[3]

The universe itself was conceived in a religious rather than a geographic sense and was divided horizontally and vertically into areas of religious significance. The horizontal universe, possibly the older concept, recognized five directions, the four cardinal points and the center. The Fire God, old and fundamental in Mexican religion, controlled the central zone. The east was assigned to the Rain God, Tlaloc, and the Cloud God, Mixcoatl (Cloud Snake), and was a region of abundance. In this idea geography was combined with

*Chal-chee-we'et-le-kway.

1:Vaillant A-5 (1928-1936)1941 NU7 Aztec NU7

772 ritual, since the intensely fertile Vera Cruz coast plain is the
776 actual source of the seasonal rains caused by the condensa-
823 tion of warm air when the Gulf of Mexico is exposed to the chill winds of the Central Plateau. The south was considered evil, possibly because of the arid zones south of Morelos and Puebla, but had as presiding deities gods associated with spring and flowers, Xipe (the Flayed One) and Macuilxochitl* (Five Flower). The west, however, had a favorable significance, being the home of the planet Venus, the evening star, which was associated and even identified with Quetzalcoatl (Feathered Serpent), the God of Knowledge. The north was a place gloomy and awful, presided over by Mictlantecuhtli† (Lord of the Dead), who, in one of those contradictions so frequent in Mexican theology, was sometimes connected with the south as well.[4] (See end papers.)

772 The vertical world was divided into heavens and hells
776 which had no moral significance, being merely overworlds
775 and underworlds. The number of heavens varied up to thirteen and represented the dwelling places of the gods, according to their rank in the hierarchy, the original creator living in the topmost heaven, and so on down the scale. One of these heavens belonged to Tlaloc, who received those who died by drowning, lightning or other causes connected with water. One school of thought divided the heavens into east
[821] and west, according to the passage of the sun. The east was the home of warriors, whose death in battle or sacrifice nourished the sun, and the west the home of women who died in childbirth, thus sacrificing themselves in the bearing of potential warriors.[5] (See Plate 57, bottom right.)

775 The rest of the dead passed to Mictlan, the underworld.

*Ma-kweel-sho'-chitl. †Meek-tla'n-tay-coot-li.

All went to be bathed. They went sounding trumpets; they went blowing shell trumpets; they beat copper discs[10] with pine [hammers].

And all the priests carried on their backs their tobacco bags,[11] and their strings of *magucy* fiber about the neck, from which went hanging the little bags, which were filled with dyed, powdered tobacco. And the fire priest went ahead of them, taking his incense burner and his *magucy* thorn. And, with it, he carried his incense bag.

And leading them went a man, an old priest. He went bearing on his shoulders the mist rattle board, called also the sorcerers' staff, which was thick, broad, very wide, and long—very long. And it rattled; he went along rattling it.

No one else remained at the priests' dwelling; the house was all empty, deserted, tenantless.

And only four stayed there—singers, who sat singing, beating the drum, rattling the turtle shell rattle and the gourd rattle, and blowing the shell trumpet. They sat plying the shell trumpet.

And when they had reached the water's edge, the priests' bathing place, where, at the cardinal points, were the mist houses, thereafter all threw themselves down and seated themselves, trembling, shivering, quaking with cold, their teeth chattering.

Hereupon spoke the old man called the old precious stone priest; he said:

"[Behold] the place where the serpents are wrathful, where the water-gnats buzz, the place where the ducks alight, where the white reeds rustle."

When he had thus spoken, thereupon all plunged into the water; they churned it up—beating the water with their hands and with their feet, crying out. Speaking hoarsely, they mimicked all the birds.

Some spoke like ducks, babbling; some mimicked wading birds, speaking like them; some imitated water ravens, talking like them; some talked like [large] herons, some like kingfishers, some like cranes.[12]

Where they bathed, there in their midst were

Viloa, onnevtemalo, tlapitzalotiuh, qujpitztiuj, in teccintli, cobcoaiiloc chilililti.

Auh in mochintin tlamacazque, qujmamama yn imiyiequach, ynmeciocozquj, inmemecacozquj, itech pipilcatiuh yn imiiequach, ontetentiuh yiaqualli: yoan qujniacantiuh in tlenamacac, ytlemauh ietiuh, yoan yuitz ietiuh: yoan itlan cana icopalxiquijpil.

Auh ce tlacatl quacujlli teiacantiuh, qujquechpanotiuh, aiochicaoaztli, no itoca naoalquauujtl, patlaoac, patlactic, patlacpol: yoan viiac, vitlatztic, yoan cacalaca, qujcacalatztiuh

aocac ce onmocaoa calmecac, cemjchictiuh, cactimoquetza, cactiuetzi in calmecac.

Auh çan naujntin in vmpa onmocaoa cujcanjme, cujcatoque, teponaçotoque, aiochiuhtoque, aiacachotoque; qujpitztoque in qujqujztli, qujqujçotoque.

Auh yn oacito atenco, yn jnnealtiaia tlamacazque: nauhcampa in manca yn aiauhcalli, njman ic ic netetreco, netlalilo, tlatzitzilca, tlaviujioca, tlacuecuechca, netlantzitzilitzalo:

in ie iuhquj njman ic tlatoa, in vese itoca chalchiuhquaquijlli: qujtoa.

Coatl ỳçomocaiã, amoiotl ycaoacaian, atapalcatl ynechiccanaoan, aztapilcuecuetlacaian:

yn occonjto y, njman ic ic onnetepeoalon atla, tlachachaquatztinemj, yn atlan, tlamaujtectinemj, tlacxiujtectinemj, atlacxiuitectinemj, tzatzitinemj, ycaocatinemj, qujntlaichecalhuja yn izquichtin totome:

cequj canauhtlatoa, tlacacauja, ceq'ntin qujntlaichecalhuja, in pihpitzti, pipitztlatoa: cequjntin qujntlaichecalhuja, yn acacalome, acacaloclatoa: cequjntin aztatlatoa, cequjntin azoquentlatoa, cequjn tocujlcoiotlatoa:

yn vncan maltiaia yn, tlanepantla manca in cuen-

10. *Chilililti*: cf. Gabriel Saldívar: *Historia de la música en México* (Mexico: Edmundo "Cultura," 1934), p. 21; *ecbouilloc; cuenillo (used)(?).*

11. *"Todos llevauan a cuestas, unas talegvillas anchas con unas cordezjtas de ixtli, con vnas borlas al cabo: y de otras colgauan, unas ttras de pequi pintadas, cosidas con las mismas talegas, que llamauan yiequachtli: y en aquellas talegas llevauã vna manera de hierba, hecha a la manera de cabuerol de cauallos, que ellos llamauan yiequalli, que era adobada con tinta, y vna polvora de vna yerua que ellos llamauan yiiol, que es como hdobre de castilla" (corresponding Spanish text).*

Clark (*op. cit.*, Vol. I, p. 57 n.) writes: *"Antiquil: acuil cane, yuil tobacco.* The Mexicans had three kinds in use: the *yuil* or Nicotiana rustica fabl.; the *quauhquil*: *quauhtlo nacazcatzin, yuil tobacco*, or Nicotiana rustica L.; and *quiaxil*: *quiaxtic acuilli, yuil tobacco*, or Nicotiana tabacum L., tobacco either in snuff or chewed in pellets called *yiequachtli*: *yuil tobacco, quauhtli grass*, or smoked as cigars or *puropel*: *puroli acuilan, yuil tobacco.* When smoked, tobacco was mixed with *xochiyetzcuitl*, ceremonial herbs, and charcoal." Cf. also *ibid.*, Vol. II, p. 156.

12. These birds are described in Lib. XI, cap. ii, § 3 of Sahagún. Cf. Robredo ed., Vol. III, pp. 168-81. Sobre dichous tres respectively as (probably) green-winged teal; ibis; Amazonian egret or heron: kingfisher (*aruspoco* or *aruppoconsul*); and cuckoldt crane (*Bludge Kapital*, p. 111, notes 1-7).

3: Sahagún M-5 (1529-1590) 1951 NU7 Aztec NU7

Thirty-fifth Chapter, which telleth of the feasts and the ceremonies which they observed in the days of the sixteenth month, which was called Atemoztli.

The sixteenth feast was called "The Falling of the Water."[1]

As for naming it "The Falling of the Water," it was when for the first time threatened, rumbled, and thundered the rains. All the common folk said, "Water cometh down"; or, "The Tlaloca descend."

And when this happened, the fire priest at the Temple of Tlaloc went [about his tasks] very soberly, devoutly, in faith and hope that in its time the rain would threaten.

And when the rain threatened, then he forthwith arose and took up his incense ladle, the stem of which was long and rounded, and it rattled. The incense ladle ended [in the form of] a serpent. And the head of the serpent also rattled; it also [was] hollow.

Then he speedily fanned the coals into a flame. Then he swiftly filled it with incense, doing only this. Then he offered incense, raising the ladle as an offering to the four directions, rattling [the ladle] greatly, to and fro. Then he went to all the courtyards of the temples, offering and burning incense everywhere. Thus he besought and called upon the Tlaloca. Thus he prayed for rain.

And a number of the common folk made vows that they would make figures of the mountain [gods].[2] And five days [before the feast], they arranged and bought paper, and liquid rubber, and obsidian knives, and they bought *magucy* fiber.

They paid great honors [to the mountain gods], and did penances that they might make the figures and cover them [with paper]. No soap was used in bathing; only their necks did they wash.[3] Neither might [a man] lie with a woman, nor a woman with a man.

And until dawn of the day of the feast, when the twenty days of Atemoztli were completed, all the

Inic cempoalli on cxtolli capitule: itechpa tlatoa in jlhujtl, yoan in tlamaviztililiztli, in qujchioaia in jpan ic cemjlhujtl ic cxtoltetl occe metztli in motenecoa Atemoztli. 796X

Injc cxtoltetl, occe ilhujtl iehoatl in motenecoa Atemoztli:

injc motenecoa Atemoztli, ca iquac iancujcan calanj, oacalaca, titicujca in qujavitl: qujtoaia in jxqujch maceoalli, atemo, anoço temo in tlaloque.

Auh in jquac y, in tlalocan tlenamacac, cenca tlaocuxtica, tlateumattica, muchixcaca, motemachitica: in quenmā calanjx qujavitl:

auh in ocalan qujavitl, njmā ic moquetztiqujça, qujcujtivetzi in jtlema, vel hujtlatztic, çan pitzaton in jquauhio, cacalaca in tlemaitl, coatl ipan quiça: auh in jtzontecon coatl no cacalaca, no iollo: [445]

njmā quixpilotivetzi in tlexochtli, in tletl njman contentivetzi in jiauhtli, ça mjxcavia: mec tlenamaca, nauhcampa in conjaoa, cenca cacalaca, ixaoaca, ichaiaca: mec iauh novian nemj, novian quiça in teujtoalco, novian tlenamaca, novian tlatotonja, ic tlatemachia, ic qujnotza in tlaloque, ic qujauhtlatlanj. [823]

Auh in cequjntin maceoalti, monetoltiaia injc tepiquixque: auh macujltica in amaxemaia, in amacoaia, yoan olli, yoa itztli, yoan ichtli in qujcoaia: [314 269]

cenca qujmaviztiliaia, yoan qujneçaviliaia injc tepiquixque, yoā tequentinque: amo mamoviaia injc maltiaia, çan moquechaltiaia, amono cioacochia: auh in cioatl amono oquichcochia. [515 834]

Auh in ie iuh oallavi ilhujtl, in jquac tlacempoalti Atemoztli, iuh cxiaui in nemoa, vel neixpoloio, in

1. "*Dejada de el Agua*," according to Tezozomoc (*op. cit.*, p. 299). "*porque este dia cessa llover, y cesan algunos dias.*" Ixtlilxochitl, (*op. cit.*, p. 313) has the same.
Concerning the term Atemoztli, Tovar refers to frequent, extraordinary deluges in the region, attributed to Tlaloc.—Kingsborough and Gibson, *op. cit.*, p. 32.
2. The Pelasio MS (Gurtler, *loc. cit.*) places this in the lesser of the sixth: "*se acostumbravan de sacrificar muchos mantenimientos*"—"we make some of the things we handle for dinner dinner (Templetime)."
3. Cf. corresponding Spanish text.

5: Sahagún M-5 (1529-1590) 1953 NU7 Aztec NU7

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The Wind

That which was known as [the wind] was addressed as Quetzalcoatl. From four directions it came, from four directions it traveled. The first place whence it came was the place from which the sun arose, which they named Tlalocan. This wind which came from there they gave the name of the Tlaloc wind. Little did it frighten men; lightly did it blow. With it, one could go in a canoe; with it one could land; with it one could cross the water.

[775]

The second place whence it came [the north] was called Mictlampa; and this was named the wind from the land of the dead. This was much feared, and caused much terror. Violently did it blow, when it set in, and the canoes could not contend with it. They could not travel forward. They could not venture forth; they could not pass across; they could not get under way in the water. Rather, all the boatmen came out and left [their craft] because of fear—those who gained their livelihoods on the water, the fishermen who used nets, or who speared [the fish]. When they saw that it was Mictlampa ehecatl which arose, then they feared evil and were troubled. They hurried, hastened, and greatly quickened their pace, plying the pole—plying it rapidly. They strained their arms, that they might come out and beach [the canoe] on the shore, on the edge of the water, near the water line. And so they said: "Often it drowneth men and sinketh canoes."

The third place whence it came [the west] was known as Cuauhlampa; it was named Cuauhtecayotl and Cuauhlampa ehecatl. Also it was called One Wind. or Maçaua; for it came from Maçauacan. And this one did not blow fiercely. Nevertheless, it was very cold. Men suffered much from [its] cold; they became livid and stiff from cold. It made them shiver; it was deadly. It made men tremble, shake, and quake; it exhausted them; it gave them stomach pains, or pains in the lungs, or the head. And yet, with it they could go ashore from the water. It did not frighten men nor terrify them.

And the fourth place whence came the wind [the south] was there from Uitztlampa. It was named Uitztlampa ehecatl. And this one was much feared and held in dread. All feared harm. It made men speechless with terror; it made them silent with fear. Because it blew swiftly, it frightened them greatly. They said: "When it ariseth, it uprooteth and breaketh trees: and it teareth walls to pieces—old walls

Ehecatl

Motenemia: ic quinotzaia quetzalcoatl. Nauhcampa oallauh, nauhcampa oalitztiuh. Inic ceccan oallauh: vmpa in iquiçaimpa tonatiuh, quitocaia tlalocâ: inin ehecatl, vmpa oallauh, quitocaiotiaia, tlalocaiotl: amo cẽca temauhti, amo cenca totoca, uel ipan acaltica viloa, vel ipan quixoa, in atlan: vel ipã panoa.

Inic occã oallauh, motenecoa mictlampa: auh inin motocaiotia mictlampa ehecatl. In hin uel imacaxo, uellamauhtia: cenca totoca, in icoac moquetza, amo vel quimamiqui in acalli: amo vellauilteco, amo uel tlautlapalolo, avel istlapal viloa, auel tlanecuilolo in atlan: çan mauhcaquixoa, mauhcaquiça in tlapanauique, in atlâca, in tlâtlamâque, in tlamjoque. In oquittaque, ca mictlampa ehecatl in omoquetz: ic cenca motenmati, motequipachoa, uel motequimati, ompilcatoque, ompipilcatoque, in tlanelioa, in tequitlanelioa: vel momaquauhtilia, inic uel onquiça, onmacana atenco, atexipalco, achichiiacpa: iuh quitoa, ca miecpa, teatlanmictia, quipolactia in acalli.

Inic escan oallauh: motenecoa cioatlãpa, motocaiotia, cioatecaiotl, cioatlampa ehecatl: no quitocaiotia ce ehecatl, anoço maçaoa ipampa vmpan oalitztiuh maçaoacan. Auh in hin, amo no cenca totoca: iece cenca itztic, uel tececmjti, tepineoalti, tepimach, tetetziliuiti, tetetzilquiti, tetzitzilquiti, teuiuioquilti, tecuecuechquiti, tecuecuechniquiti: tezillanquauhtili, teiomotlanquauhtili, tetzoteteconeuh. Auh tel, uel ipan quixoa in atlan, amo temauhti, amo temauicuiti.

Auh inic nauhcampa, oallauh ehecatl, vmpa uiztlampa: motocaiotia uiztlampa ehecatl. Auh inin, cenca vel imacaxo, mimacaci: netemmacho, aoc tenaoztili, aoc tetlatolti: ipãpa cenca totoca, cenca tlamauhtia. Quixoa, in icoac moquetza: vel quitzincoa, quipoztequi in quauid: youa quiviviniia in tepantli, in tepançolli, in xacalli: quecatoctia in tlatzacuilli, in chiauacalli. Auh in vei atl vel colinja, quiteponaçoa,

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and straw huts. The wind carrieth off fences and enclosures. And it stirreth up the seas; it maketh them froth and foam. It formeth waves; there is a great din as of waves breaking. There is a great crackling noise." And it tossed and cast canoes into the air. Just so, indeed, did the north wind sink them.

quipoçonaltia, cacuecuenistia: iuhquin tetecuicaimani, cocomocatimani: auh in acalli caaconaiani, caacotlaço: vel no iuhqui, quinamiqui in mictlampa chocatl.

821
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Lightning; the Lightning Flash

They addressed it as, and named it, many things—the mist which went winding [like a serpent], the thunderbolt, the reed staff. When lighting flashed and lit up repeatedly, we were blinded, we lost our sight, our vision was darkened. It startled us; we were terrified. It was unbearable to look at; it was dazzling. Everywhere it flashed repeatedly—again and again—like the light of the dawn breaking over and over. Thus did it come; it came twisting and winding.

Tlapetlanjlloti, tlapetlanjliztli: much ic quinoczaia, quitocaiotiaia, aiauhcocolli, tlapetlanjlquauitl, ortopilcoauitl. In icoac tlapetlani, tlatlapetlani: tiapoaoa, tiamimiqui, titiznauhtia, titocuitiuetzi: ainamiquiliztli, ainamiquiztli, nouiian tlatlanextimoquetza: iuhquin tlauizcalli moquequetza: inic oallauh oalcocoliuhtiuh, cuecueliuhtiuitz.

821

[p. 16 is blank]

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The Seventh Chapter telleth of the year counter and the year sign.

One Rabbit

It is said [that this was] the year sign and year counter of the south. For thirteen years it carried, set on its path, took with it, and bore the burden [of the year]. Always, during each [of the thirteen] years, it was the first, the one which led, began, made the start, and introduced as many year signs as there were: Reed, Flint, and House. Of the one [known as] Reed, it was said [that it was] as it were the sign of the east; that is, the year sign of the sun. For from there issued the light which shone forth.

And the third year sign, the one [known as] Flint, was called the sign of the north. For [the north] was said to be toward the land of the dead. Thus have the old people spoken: it is said that when one died, to that place set out, went straightway, and proceeded the dead. Therefore, when someone died—when [the women] adorned him, when they wrapped him in his mantle and bound him [in wrappings]—they made him look toward and seated him looking to that place.

And the fourth year sign, the fourth in order, [was] the one known as House—the sign of the west. For this reason they named it Cioatlampa: it is said that there dwelt but women; none of us men were there.

These four year signs, year count[ers], as many times as they came to appear, [so many times] they came to be the beginning year signs.

When all the thirteen-year [periods]—all four of them—had concluded, ended, and finished, thus proceeding around, to give and leave their works from year to year, this [last] one came to, stopped at, stopped, knocked against, and ended at Thirteen House, the sign of the west. That is, now it approached [the end of its] thirteen years of labor.

And then One Rabbit came to settle itself as the sign of the south. When this occurred and it established itself and began its work, then to bear a year

Inic chiconme capitulo, itechpa tlatoa: in xiuhtlapoalli, in xiuhtonalli.

Ce tochtli.

motecuca: uiztlampa xiuhtonalli, xiuhtlapoalli: matlacxiuitl omei tlauica, tlaotlatoctia, tlatqui, tlamama. In nuchipa cecexiuhtica, vel tlaiacana, tlaiacana, quipecaltia, ipeuhca nuchioa, quizticia in isquiteti xiuhtonalli in acatl, in tecpatl, in calli. In ichoatl acatl, mitoa: tlapcopa tonalli, iuhquinma, q. n. tlauilcopa xiuhtonalli: ipāpa ca umpa oalneci in tlauilli, in tlanestia. 805 823

Auh inic ei xiuhtonalli, ichoatl in tecpatl: motecuca mictlampa tonalli, ipampa in mjtoa mictlampa: iuh quitoaia in veuetque, quilmach in icoac micoa: vmpa itztiui, vmpa tlamelaoa, vmpa tlatotoca in mimicque. Ichica, in icoac aquin miquia, in oconchichiuhque, in oconquiquimiloque, in oconiilpique: vmpa quitlachialtiaia, vmpa quitrriltitimotlaliaia. [1775] [764]

Auh inic nauj, tlanauhcaiotia, xiuhtonalli: ichoatl in calli motecuca, cioatlampa tonalli. Ipāpan iuh quitoaia, cioatlampa: quilmach, çan machi cioa umpa oaoque, aocaque toquichtin.

Inin nauhtecme xiuhtonaltin, xiuhtlapoaltin: inquiteme cocoppa moquetztini, tonalpeuhcaiome machialtiuj. 805

Inic machi mitlatlacxiuitl omeci, quitlamja, conaitia, quiznoquiztia nauhcritin: inic tlaiaoalcuiui, quinomacuiui, quimocuilitini, intequiuh, cecexiuhtica: ichoatl iech omaci, iech tlaocaoa, iech oconapi, iech ontlatocaoa, ontlatonoquiztia in matlactlomei calli, cioatlampa tonalli. q. n. ic ocxitli in matlacxiuitl omei icquich.

Auh ninan ic oalmoquetza in ce tochtli: uiztlampa tonalli. In icoac, y, moquetza, in quipecaltia icquich, inic ce xiuitl tlauicac, tlaotlaoctin: ceuca 805 731

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the salt is commonly extracted from soil of several types rather from the water itself. This practice would be expected to arise in a country of inland salines, not along the seacoast. Moreover, fractional evaporation is used to give different products, according to Apenes, the last of the liquors being the source of saltpeter. We cannot yet be sure that the whole complex is pre-Cortesian, but it suggests a knowledge of limnologic and soil chemistry among the Aztecs that was at least as great as their ceramic and metallurgic skill would imply.[4] The point is not only of considerable importance, but is capable of verification by chemical archaeology; that no attempt to do so has been made so far is another indication that the scientific knowledge of non-Western peoples exceeds in some respects that of the historians and ethnographers who study them.

Salt is one of the seldom-considered essentials of human welfare. Mendizábal makes the provocative point that if the Aztecs had been more generous with their salt, the Tlaxcalans (who had no salines in their domain) might not have been so ready to ally themselves with Cortés, and the course of history might have been rather different.

HYDROGRAPHY. The demonstration that the Aztecs had detailed knowledge of all aspects of their lakes that might be used for human sustenance is not itself a proof that they had a developed limnologic science. Far more primitive people have known and done as much, and none of the practices mentioned, with the possible exception of fractional evaporation of salt water, are beyond the capabilities of the Banyoro, for example, who live on Lake Albert in Africa (Worthington and Worthington, 1933). The urbanization of Tenochtitlán, however, brought problems in its train that simpler societies could hardly have faced. Lake *villages* are known all over the world, but lake cities are much less usual. In meeting these problems the Aztecs and their

[4] A piece of chemical knowledge that has been entirely overlooked is the manufacture of some salt from urine. Bernal Diaz del Castillo (1910 edition, p. 72) mentions the sale of "many canoes full of human excrement, and these were kept in the creeks near the market, and this they use for making salt or tanning skins, for without it they say that they cannot be well prepared". The reference to tanning of skins shows clearly that the excrement was urine and not feces, for the tanning properties of uric acid are still taken advantage of in modern Mexico; moreover, Bernal Diaz goes on to describe the collection of feces and their use as fertiliser. What "salt" other than uric acid or sodium chloride could have been extracted from urine is problematical; nitrates would have been the most valuable, and they could conceivably have been separated from the chlorides by fractional evaporation, as in the case of salt water. In the history of western chemistry the most important salt found in urine was microcosmic salt, $NH_4\ NaHPO_4 \cdot 2H_2O$, which served Brand as the source of phosphorus.

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neighbors demonstrated practical control over the lacustrine as well as other components of their environment.

At the time of the Conquest, according to extensive researches summarized by Orozco y Berra (1864), Maudslay (1908, 1910, in the 2nd and 3rd volumes of the Hakluyt Society edition of Bernal Diaz del Castillo), and especially by Schilling (1939) and Linné (1948), the Valley lakes were more or less one continuous sheet of water. Schilling's series of sketch maps is reproduced in Figure 1. Cortés, in his second letter to Charles V (MacNutt edition, 1908, vol. 1), speaks of two lakes, because Lake Texcoco, the lowest-lying and most saline body of water, was separated from the freshwater portions by a great dike, the *albarradón* of Nezahualcóyotl. The Valley lakes of course were without outlet to the sea, and the drainage operations that began in the late 16th century and were made effective only in 1900 were devoted to the northward diversion of Lake Zumpango, regarded as the source of the most dangerous floods, to the Río Tula. The 16th-century historians believed that Texcoco had a subterranean outlet to the sea by way of a spring in the valley of Tula. Pomar (García Icazbalceta's edition, 1891, p. 58) claimed to have seen it, while Sahagún (Robredo edition, vol. 3, p. 298) described the "whirlpool" in the center of the lake as the scene where small boys were sacrificed every year. It is reasonable to suppose that the legend of the outlet was believed by the acculturated Indians, but it does not follow that the educated Aztecs believed it.

The "Lake of Mexico" of the historical sources is usually the freshwater part that surrounded the Aztec capital, Tenochtitlán. This part is now dry, as is the southernmost lake of Chalco. Dikes that served as causeways connected Tenochtitlán with the mainland, but the most important dike from the hydrographic standpoint was that of Nezahualcóyotl, which lay to the east of the city. According to tradition, the dike was built by the king of Texcoco in 1446, during the reign of Montezuma I. It was 16 km long, and required the labor of 20,000 men. The reason given for its construction was to protect the Aztec capital from floods, though it is not clear why a Texcocan king should have contributed so generously to his rival's advantage. Of the advantage, however, there can be no doubt. All of the southern valley floor, from Chalco to Tenochtitlán, was doubtless covered with *chinampas*, the artificial islands that have been called "floating gardens" since the days of the imaginative 18th century historian Clavijero. Floods along the course of this drainage would on the whole have been beneficial, though inconvenient; the real danger threatened from the Texcoco side, whence salt water, driven by freshets or seiches,[1] might disastrously drown the *chinampas*. Freshets, that brought large river fish through

[1] [i.e., an oscillation of the surface of a lake lasting from a few minutes to several hours, thought to be due to inequalities of atmospheric pressure. —Analyst]

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chilacaxtli = *Azolla* sp.", and *Tequixquiac* (3G), "saltpeter water", all contain the idea of a lake as well as the sound for water, and all are shown in section. The ideology behind the glyphs was undoubtedly formed before the Aztecs entered the Valley of Mexico, during their wanderings through semi-arid country where streams are of vital importance and lakes are small and astatic. Moreover, the glyph for flowing water is a horizontal waterfall, and is the widespread and ancient Mesoamerican columnar stream, (Rands, 1955), rotated 90 degrees. It is probably no accident that streams are shown as something to be crossed, while lakes are thought of as bodies of water with definite boundaries and *containing* useful objects.

The remaining glyphs of Figure 4 require little comment. *Tamazolan* (3I), "toad", is perfectly clear, and Sahagún gives this as the meaning, but Clark interprets it as "frog". *Iztatlán* (3J), "near the salt", is a salt-pan, with *tlantli*, teeth, showing the place-name ending, while *Iztacalco* (3K), "salt house", is literally that: an earthen *pila* serving as a filtration apparatus in which the clear salt water is collected before being placed in the evaporation basin shown at the top. *Ayotlán* (3L), "turtle", is obviously a freshwater species, probably *Kinosternon hirtipes*, though Clark's interpretation ("a captured turtle on its back") shows confusion with the marine *Chelone*, whose name was *chimalmichin* ("shield fish"). *Tollán* (3M), "cattails", has been discussed in the previous section.

If the Aztecs commonly thought of lakes edge-on, so to speak, they were perfectly capable of showing them in plan. For cartographic purposes it would be essential to show a bird's-eye view, and there are many indications that Aztec cartography was well developed (Linné, 1948). No certain examples have survived, unless we except the famous "maguey plan" (Toussaint *et al.*, 1938) that shows part of the city of Tenochtitlán. This map is not on maguey paper, as Maudslay (1910) and many others have believed, but on native paper made of *Ficus* bark (Lenz, 1948), and unpublished work by D. Robertson suggests that it is in fact a pre-Conquest document on which later elements, such as churches, have been superimposed. Whether pre-Conquest or not, it shows the lake of Mexico only by implication, as empty space off the edge of the city. The Codex Xólotl, an early but not pre-Conquest Texcocan pictographic manuscript, clearly shows the Valley lakes with a string of mountains overlooking them, but not in a way suggesting that a map was intended. The nearest equivalent to an Aztec map of a lake is probably the "Aztlán" picture in the Codex Boturini, reproduced in Figure 4. In fact, since the two earliest European maps of the lake of Mexico (in the 1524 Nuremberg edition of Cortés' Letters

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and in the 1556 Ramusio edition of the "Anonymous Conqueror") are obviously imaginary, it may be said that the Boturini picture is possibly the oldest surviving map of a New World lake, and it is ironic that we cannot say what lake it represents.

About this famous picture all that can be said with confidence is that it shows a lake with an island. The island is universally identified as *Aztlán*, the legendary home of the Aztecs, yet the glyph at the top

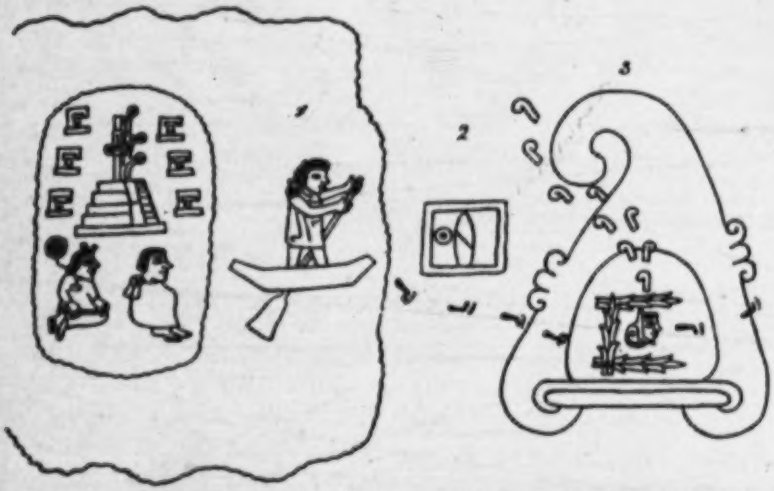

Fig. 4. Origin of the Aztecs, from the *Tira de la peregrinación México* (Codex Boturini). The town, here labelled *Aacatl*, but identified by authorities as *Aztlán*, is situated on an island in a lake, presumably in western Mexico.

designates it as *Aacatl* (*atl*, water + *acatl*, reed). *Aacatl* turns up on a later page as a personal name, and it may indeed be the name of the male figure at the right of the island, for he is otherwise nameless, though his female companion is named *Matlalin*, from *matlatl*, a fish-net. It would be idle sport to list all the places that Aztlán is supposed to have been; Orozco y Berra (1880, p. 66–68) considered it to be the island of Mexcalli in Lake Chapala, while Seler (n.d.) rejected all the legendary wanderings of the Aztecs in western Mexico and brought Aztlán, full circle, back to the Valley of Mexico itself. Escalona (1943) argues with some plausibility for the lake of Metztitlán, in Hidalgo, while Rendón (1948), with even greater plausibility, prefers the lake at the headwaters of the Río Lerma, just west of the Valley. The truth is that the Aztlán part of the Aztecs' history appears full-blown in the circle of Jesuit histories stemming from the Dominican Durán, while

Twelfth Chapter, which telleth of earthquakes.

When the earth quivered, a delusion of the natives was to be seen. When the earth quaked, then they quickly took their children by the neck and lifted them,[13] so that they might soon grow big — so that they might mature quickly. It was said that if they did not take them by the neck and lift them quickly, they would with difficulty wax larger.. And they said that the earthquake would bear [the child] away if they did not grasp him by the neck and lift him. And they sprinkled water upon their faces.

And their houses, their square wooden beams, their food storage bins, their cooking pots, and indeed all their goods, everything, they sprinkled with water. And if they forgot something, they wrangled over it; it was said that the earthquake would take it away. And everyone raised a din and cried out while striking the hand to the lips in order to make known [the earthquake] to those who knew not of it.[14]

Injc matlactli vmome capitulo, ytechpa tlatoa yn tlallolinjliztli. 823 856

In jquac tlallolinj, centlamantli neci innetlapololtiliz in njcan tlaca: in jquac tlallolinj, njman iciuhca quinquechaana in jnpilhoan, injc yciuhca quaquauhtiezque, injc yciuhca manazque: quilmach intlacamo quinquechaanazque iciuhca, ayaxcan quauhtianque: yoan quitoaia, quivica in tlallolinjliztli, intlacamo quiquechaanazque, yoan quimjxalpichiaia.

Auh yn jncal, in jntlaquetzal, in jncuezcon, in jnxuc, in ye ixquich intlatquj, muchi catzelhuja: auh intla ytla oquiicauhque, yc maoaia: quilmach quivica in tlallolinjliztli: yoan ixquich tlacatl ycaoacaia, motenvitequja: yc quinmachiltiaya, in amo quimati. 823

Thirteenth Chapter, which telleth of the [three] hearth stones.

Concerning the [three] hearth stones there was also a delusion of the natives. When they saw someone kicking[15] the hearth stones, they restrained him from doing so. They said to him: "Do not kick the hearth stones. It will deaden thy feet when, perchance, thou goest to war." They said to him that now he would not be able to walk or run in time of battle. His feet would be numbed; quickly he would fall into the hands of their foes. Hence the natives restrained their youths, that this might not befall them.

Injc matlactli vmey capitulo, ytechpa tlatoa in tenamaztli. 354

In jtechpa in tenamaztli: no vncatca innetlapololtiliz, in njcan tlaca: in jquac in aca quitta, in quitlicçatica in tenamaztli: yc quitlacaoaltiaia, quilhujaia: macamo xictliçatia in tenamaztli mitzjcxitmjctiz in jquac intla tiaz iavc, quilhuja: aiocmo vel nenemjz, aiocmo vel motlaloz in iaupan: ça ycxitmjmjquiz, yciuhca ynmac vetziz in jniaovan: yajc quintlacaoaltiaia in jntelpuchoan, in njcan tlaca, injc amo yuh inpan muchioaz.

Fourteenth Chapter, which telleth of the tortilla doubled over on the griddle.

When a woman made tortillas, if her tortilla doubled over, there was also a delusion of theirs. She said: "Someone who now cometh hath kicked

Injc matlactli onnavi capitulo, ytechpa tlatoa in comalco mocuelpachoa tlaxcalli. 252

In jquac tlaxcaloa in cioa, intla ocuelpachiuh itlaxcal: no vncatca innetlapololtiliz, quitoa: aquin ie vitz oquiioaltilicçac: auh in anoce yoquichvi, in ca-

12. *Quiquechaanaz*: literally, they took them by the neck. The corresponding Spanish text reads: "*tenianse a sus niños con ambas las manos, por cabo las sienes, y los levantauan en alto.*"

13. *Ibid.*: "*para que tubiesen sabor[ilegible], que tendrian la fuerza.*"

14. *Quitlaquetzaz*: literally, were kicking it (cf. ollaya, Molina, *op. cit.*); corresponding Spanish text: "*los que pensian el pie sobre los trebedes, que eran tres piedras.*"